Captain's Tryouts

Disease Detectives Division C

Name:

Team Name:

School Name:

Team Number:

Part I

Write the letter corresponding to the term in the parentheses:

Plague: ( )	A. Places an emphasis on prevention compared to Clinical Approach
Herd Immunity: ( )	B. The continuous, systematic collection, analysis and interpretation of health-related data that is essential to the planning, implementation and evaluation of public health practices
Active Immunity: ( )	C. A series of successively larger peaks, which is reflective by the case number increasing exponentially.
Epidemic Curve: ( )	D. Strength of association between 2 events
Propagated Outbreak: ( )	E. Resistance to the spread of a contagious disease if enough members of a population are also resistant
Descriptive Epidemiology: ( )	F. Time in between when a person comes into contact with a pathogen and when they first show symptoms or signs of disease.
Census: ( )	G. Describing the distributions of diseases and determinants
Incubation Period: ( )	H. Capacity to cause disease in a host
Stage of Susceptibility: ( )	I. Deals more with individuals and families
Clinical Health Approach: ( )	J. A serious, potentially life-threatening infectious disease that is usually transmitted to humans by the bites of rodent fleas (how it is spread can be modified)
Specificity: ( )	K. The enumeration of an entire population. Point given if any is mentioned: residence, age, sex, occupation, ethnic group, marital status, birth history, and relationship to head of household.
Zoonosis: ( )	L. A histogram that shows the course of a disease outbreak or epidemic by plotting the number of cases by the time of onset.

Public Health Approach: ( )	M. How specific a certain test is for a particular condition, trait, etc
More on next page Odds Ratio: ( )	N. Resistance developed in response to stimulus by an antigen (infecting agent or vaccine) and usually characterized by the presence of antibody produced by the host.
Surveillance: ( )	O. Disease transmitted through animals
Pathogenicity: ( )	P. Pre-exposure period in the natural history of the disease OR period in which a population/individual is vulnerable or at risk

Part II Case Study:

Enoch, a student of Salinas High School, was enjoying the second semester senior life at a party last Friday night located at school. However, he was not able to come to school the following Monday, due to severe vomiting. Individuals from the party were closely monitored after this case was reported. Over the course of the month, more and more cases were reported of similar symptoms. Between August 10th - August 13th, 14 different cases were reported. Between August 13th - August 16th, 20 different cases were reported. Between August 17th - August 20th, 13 different cases were reported. The case was reported to you, a CDC epidemiologist, on September 10th.

1. Does this classify as an outbreak? Circle: (YES / NO)

2. Draw an epi curve for this outbreak

3. What type of epi curve is this?

4. What type of study could best be used in this scenario to determine the disease? Why?

5. What type of surveillance was used in the investigation?

After waking up in the hospital, Enoch complained of the food he had eaten the night before. You make a list of potential food that might have caused the sickness

	# of people who ate the food			# of people who didn't eat		
Food	Sick	Total		Sick	Total	Odds Ratio
Canned Mackerel	43	59		10	59	
Canned tuna	21	59		27	59	
Ice Cream	9	59		9	59	
Fried Scallops	11	59		14	59	

6. Calculate the odds ratio for each of these food items. Show general equation for odds ratio for full credit.

7. Calculate the relative risk for each of these food items. Show general equation for relative risk for full credit.

8. Of these two calculations, which can be used in the investigation of this disease? Please elaborate why, and what that number means in accordance to this investigation.

9. Which food is most likely to be causing the sickness? Use the odds and relatiUse either of the calculations to justify your answer.

10. Why does the data point from Ice Cream offer little to no help for the investigation?

11. Write a descriptive case definition for this

Part III Multiple Choice/Short Answer Section :

If multiple choice, write the best answer's letter on the line next to each number. There may be multiple answers for each problem
If short answer, write answer in given space

1) _____ Jorge was doing a science experiment on the internal temperatures of humans typically throughout the day. However, it just happened that the group of people he used for data were all sick with the common flu. What type of error would this be?
    a) Systematic
    b) Random
    c) Human
    d) Gross
    e) General
    f) Structured
    g) Instrumental

2) _____ The number of animals that die depends on the _____
    a) Pathogenicity
    b) Virulence
    c) Attack Rate
    d) Odds Ratio

3) _____ The etiologic agent for an unknown disease is found to have come from raw produce. Which of these diseases could the unknown disease be?
    a) Hepatitis
    b) Listeriosis
    c) Salmonellonellis
    d) Staphylococcal Food Poisoning

4) _____ Most of the major health problems in poorer countries around the world are due to
    a) Malnutrition
    b) Parasitic worms and microorganisms

c) Unsanitary conditions
d) Air Pollution

5) _____ Which of the following is NOT an agent of a health event?
a) car crash
b) rabid dog
c) cold virus
d) Mycobacterium tuberculosis

6) _____ Which of the following can be found in viruses?

A. Protein coat

B. DNA

C. Mitochondria

7) _____ Which of the following is an example of cross-contamination?
a) Jane infects John by sneezing on him
b) George's raw chicken drips onto his fruit salad inside the fridge. George later gets a salmonella infection from the fruit salad.
c) A virus infects a bacterial cell, providing it with a new gene that makes the bacteria even more dangerous
d) A disease affecting one population and another disease affecting another population suddenly and inexplicably switch populations

8) _____ Which of the following is an important part of the first step of the epidemiologic process?
a) examining pre-existing medical statistics for the area to establish the existence of an outbreak
b) making sure all diagnoses are not due to lab error
c) gathering supplies and researching the disease applicable to the investigation
d) creating a case definition

9) _____ Which of the following are true statements?

A. Observational studies work backward from an effect to a suspected cause

B. Cohort studies work forward from the cause to the effect

C. Cohort studies can be performed retrospectively or prospectively

10) _____ A patient is diagnosed with a viral infection. Which of these treatments has the highest chance of being effective?
    a) Penicillin
    b) Doxycycline
    c) Tetracycline
    d) None of these will be effective

11) _____ One of the fundamental premises underlying the study of epidemiology is…
    a. disease, illness and ill health are randomly distributed in a population.
    b. disease, illness and ill health are not randomly distributed in a population.
    c. Disease, illness and ill health are only randomly distributed in large populations.
    d. Disease, illness and ill health are very rarely distributed in large populations.

12) _____ Which of the following is true about relative risk? Circle all that apply

A. Relative risk estimates the extent of the association between an exposure and a disease.

B. A relative risk = 1.0 indicates that there is no association between exposure and disease.

C. A relative risk >1.0 indicates a positive association or an increased risk.

13) The acronym CDC refers to:
    a) Center for Disease Control
    b) Center for Disease Combat
    c) Combat for Disease Control
    d) Center of Disease Prevention

Match the famous scientist to his achievement.

a. Used systematic study to end Cholera outbreak
b. Developed theories that environments influenced disease
c. Created a set of postulates to prove disease is linked to a cause

14) _____ Hippocrates

15) _____ John Snow

16) _____ Koch

17) _____ The Spanish Flu in 1918 and the Black Plague in the Middle Ages were examples of:
    a) endemics
    b) vehicles
    c) epidemics
    d) pandemics

18) _____ A cluster of cases
    a) occurs within a small geographic area
    b) occurs within roughly the same time period
    c) does not necessarily need to contain a number of cases greater than the expected amount
    d) a and b

19) _____ As soon as the causative agent for an outbreak is identified, an epidemiologist should
    a) create a report
    b) begin to control and prevent the disease
    c) b then a
    d) a then b

20)_____ Which of these is an example of temporality?

a) observations of an association between risk factors and the disease are found in more than one population
b) the suspected cause occurs before the effect (Correct)
c) the suggested hypothesis is biologically plausible
d) increasing risk responds with increasing exposure

21) _____ What advantages exist from using a case-control study?

a) Possible study of Rare Diseases (Correct)
b) Retrospective Bias
c) At least 2 possible outcomes
d) A possible time-order confusion

Part IV Free Response

Points (/ 40)

1. According to the CDC, what is the recommended temperature for food storage in refrigerators?

2. Name the transmission triad

3. Name the epidemiologic triad

4. In which of Hill's Bradford Hill Criteria is exposure suppose to be identified? Describe the step's purpose.

5. What is the difference between the Clinical Approach and the Public Health Approach?

6. What four vital questions are essential to ask when investigating an outbreak?

7. Give the equation for overall growth rate using Natality, population death rate, population birth rate, and mortality. Your equation must include natality, and may include any of the other terms.

8. List the steps of the chain of infection in order.

9. What is FATTOM used to describe? What do each of the letters in the acronym stand for?

10. What is infant mortality rate? Give the general equation to calculate it.

11. What is the difference between a disease endemic to a population and a disease hyperendemic to a population?

12. What is Natality?

Epiville has a population of 100 people. Before the party, only one person was infected with Cholera. After the party, another 50 had fallen ill. The cholera victim and one other family member were not in attendance at the party, which was later investigated as an outbreak of cholera.

13. What was the attack rate for the outbreak? Show general equation of attack rate for full credit.

14. What was the prevalence of Cholera in Epiville after the outbreak? Show general equation of prevalence for full credit.

15. The resistance of a population to an attack by a disease to which a large proportion of the members of the group are immune is referred to as:

16. What does the spectrum of disease represent?